

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of

Replacement of Part 90 by Part 88
to Revise the Private Land Mobile
Radio Services and Modify the
Policies Governing Them

PR Docket No. 92-235

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JUL 30 1993

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

**REPLY COMMENTS
OF ASSOCIATION OF AMERICAN RAILROADS**

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The **ASSOCIATION OF AMERICAN RAILROADS** ("AAR"), by its attorneys and pursuant to Section 1.415 of the Rules of the Federal Communications Commission ("FCC" or the "Commission"), hereby submits its Reply Comments in the above-captioned Notice of Proposed Rule Making ("NPRM").^{1/} In this proceeding, the Commission has proposed various measures for relieving congestion and promoting spectrum efficiency in private land mobile radio ("PLMR") frequencies below 512 MHz.

I. BACKGROUND

The railroads operate PLMR systems for critical safety and operational functions, collectively utilizing about 16,400 base stations nationwide with associated mobile and portable radios, telemetry devices and other equipment valued at more than \$576

^{1/} Notice of Proposed Rule Making, 7 FCC Rcd 8105 (1992). These Reply Comments are timely filed pursuant to a Commission order extending the reply deadline to July 30, 1993. Order Extending Reply Comment Period, DA 93-800, released July 2, 1993.

million. The industry is committed to achieving greater spectrum efficiency in its own operations consistent with safety and interoperability requirements.

In comments filed May 27, 1993, in this proceeding, AAR encouraged the Commission to adopt and promote "refarming" measures that provide PLMR users the greatest spectrum efficiency gains at the least cost. AAR urged the Commission to (1) ensure that sufficient channel pairs are available to enable users to implement trunking as soon as possible, and (2) to continue exploring the option of making available clear spectrum with a very narrowband channel plan for users with voice-only requirements rather than imposing a very narrowband channel plan on all users.

AAR opposed the proposal to consolidate the 19 existing PLMR services into four pools and urged the Commission to preserve the Railroad Radio Service as a separate service category with frequencies dedicated to railroad use and retain AAR as frequency coordinator. AAR also opposed the Commission's plan for converting PLMR frequencies to a very narrowband channel plan and proposed an alternative "offset overlay" channel plan for achieving narrowband efficiency in the 150-174 MHz band. In addition, AAR opposed the Commission's proposed height-adjusted power limits and endorsed the "safe harbor" proposal of the Land Mobile Communications Council ("LMCC") as a preferable alternative.

II. THE COMMISSION MUST ENSURE THAT ITS "REFARMING" DECISION TREATS PLMR SERVICES FAIRLY IN RELATION TO ALL OTHER EXISTING AND FUTURE SPECTRUM USERS.

From the outset of this proceeding, the Commission has emphasized that its overarching goal is to expand the supply of spectrum available for PLMR use. Notice of Inquiry, 6 FCC Rcd 4126, 4129 (1991) ("NOI"). See also NPRM at 8105-06. The railroads and other PLMR users, now operating under conditions of severe frequency congestion and a shortage of spectrum for all radio uses, wholeheartedly support this objective. The comments make painstakingly clear, however, that the Commission's proposed methods for expanding PLMR spectrum supply would impose enormous financial and operational burdens on users and the public. The comments are replete with estimates of the financial impact of the Commission's proposals in the millions and billions of dollars. See, e.g., Comments of AAR at 25, 33-34 and Exhibits 10 and 11; Comments of American Mobile Radio Association, Inc. ("AMRA") at 3 n.1; and Comments of American Trucking Association ("ATA") at 4, 7 and 16. In addition, the comments paint horror stories regarding the potential disruption and impairment of operations that could occur, potentially crippling large and small businesses and threatening public safety. See, e.g., Comments of Yellow Cab at 1-2; Comments of Montana Power Company at 10-11; Comments of Coalition of Industrial and Land Transportation Land Mobile Radio Users ("Coalition") at 2-4; and Comments of Associated Public-Safety Communications Officers, Inc. ("APCO") at 6-9. Given the huge quantity of PLMR equipment

now in use, these anticipated effects of "refarming" cannot be dismissed as exaggerations.

The comments have raised the question of whether the Commission has unfairly singled out the private radio industry with its "refarming" proposals. Despite the enormity of the burdens facing existing users -- and uncertainty about whether current "refarming" proposals would significantly expand spectrum suitable to meet PLMR users' requirements -- the Commission has thus far failed to seriously consider the option of allocating additional spectrum to relieve congestion on PLMR frequencies. Instead, it has proposed a plan that actually would result in a net loss of spectrum for PLMR services. Licensees would be required to meet spectrum efficiency mandates but would not reap the full benefits of their efforts. One-third of newly created VHF channels would be reassigned to non-PLMR users!

When considering its proposals in this proceeding, the Commission must remain mindful of its obligation under the Communications Act of 1934, as amended, to allocate and assign radio frequencies and regulate their use in accordance with the public interest. 47 U.S.C. § 303. This obligation requires the Commission to consider its "refarming" proposals within the broader context of its overall management of all radio spectrum. When allocating spectrum, the Commission must analyze the relative public need for, and benefits to be derived from,

various radio services.^{2/} The public interest requires a similar analysis when considering spectrum efficiency mandates, especially when allocation of new spectrum is a feasible alternative to imposing those mandates.^{3/}

In its initial NOI in this proceeding, the Commission recognized its obligation to consider the spectrum needs of PLMR users in relation to spectrum needs of other services:

We see three general ways to meet current and future PLMR requirements. First, the supply of spectrum available for PLMR use can be expanded. In doing so, the needs of PLMR users must be balanced against those of other radio users such as broadcasters, common carriers and the federal government.

6 FCC Rcd at 4129 (footnote omitted) (emphasis added). Since acknowledging this statutory responsibility, however, the Commission has proceeded to "refarm" the PLMR spectrum in a vacuum, giving little consideration to whether spectrum allocated to other services might be better used to relieve congestion for PLMR users.

At the same time the Commission has been trying to squeeze

^{2/} See, e.g., Advanced Television Systems and Their Impact on the Existing Television Broadcast Service, MM Docket 87-268, 2 FCC Rcd 5125, 5136 (1987) (spectrum allocation decisions require an understanding of the value of employing a particular portion of spectrum for one use relative to other potential uses).

^{3/} Section 303 of the Communications Act requires that Commission regulations affecting licensees and use of spectrum be in the public interest. 47 U.S.C. § 303. Moreover, implementation of policies that promote spectrum efficiency are considered part of the Commission's obligation to manage spectrum in the public interest. See, e.g., "U.S. Spectrum Management Policy: An Agenda for the Future" NTIA Special Publication 91-23 (1991) at 160.

additional spectrum out of PLMR users, it has reallocated additional spectrum to other radio services.^{4/} Comments of Blooston, Mordkofsky, Jackson and Dickens ("BMJ&D") at 3. Indeed, the Commission's approach to a spectrum shortage for PLMR services stands in stark contrast to its response to demands for more spectrum for personal communications services ("PCS") and advanced television ("ATV"), neither of which have the long history of serving the public interest that PLMR services have. The Commission has allocated 110 MHz for PCS and another 110 MHz for as-yet undefined "emerging technologies". First Report and Order and Third Further Notice of Proposed Rulemaking, ET Docket 92-9, 7 FCC Rcd 6886 (1992). In the ATV proceeding, the Commission initially considered allocating additional clear spectrum to broadcasters. Tentative Decision and Further Notice

^{4/} Exacerbating the perception that the Commission has arbitrarily singled out the PLMR services to bear the brunt of the spectrum shortage is the fact that many private radio user groups are facing a loss of spectrum and/or displacement of facilities in other frequency bands as well. The Commission has reallocated for "emerging technologies" the 2 GHz spectrum that railroads, utilities, petroleum and pipeline companies and other industries have used for decades for private fixed microwave operations, leaving those users to relocate to other spectrum, convert to fiber optics or share spectrum with new services. In addition, the railroads may have to suspend deployment of their automatic vehicle monitoring ("AVM") system on 900 MHz frequencies and relocate the thousands of AVM facilities already deployed there as a result of a Commission reallocation plan to accommodate wide-band AVM systems. Notice of Proposed Rule Making, PR Docket No. 93-61, released April 9, 1993. In light of the Commission's repeated proposals for the railroads and other private radio users to make way for new services, the "refarming" proposal, with its accelerated conversion timetable and requirement to give up one-third of new channels, feels a bit like salt in an open wound.

of Inquiry, MM Docket 87-268, 3 FCC Rcd 6520, 6530 (1988). Even though the current plan would require broadcasters to provide ATV on existing broadcasting frequencies, the Commission never considered imposing efficiency mandates on broadcasters that would result in a loss of spectrum. Id. at 6530-32. Moreover, the Commission has not analyzed in this proceeding whether allocating additional spectrum to ensure the safety and efficiency of train operations would provide greater public benefits than using spectrum for ATV so that audiences can view sharper images of, for example, "Wheel of Fortune". The Communications Act requires the Commission to make such comparisons across radio service categories.^{5/}



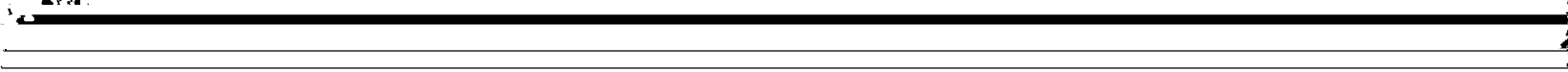



AAR recommends that the Commission take two specific steps in order to meet its spectrum management obligations. First, the Commission should ensure that all radio licensees, including broadcasters, share equally in spectrum efficiency mandates.^{6/} As stated by BMJ&D, technological changes affecting all radio users provide the opportunity to require improved efficiency:

BMJ&D believes that the Commission has unnecessarily focused on spectrum allocated to the rapidly expanding

^{5/} The trend toward delivery of video programming by cable and fiber links to the home, rather than by over-the-air broadcasting, makes it essential that the Commission continually analyze the relative demand for spectrum by broadcasters and other radio frequency services.

^{6/} The comments of the Association for Maximum Service Television, Inc. ("AMSTV") create the impression that PLMR users are using outdated, woefully inefficient technologies and have been stealing spectrum from broadcasters. The extreme positions AMSTV advances are spectrum protectionist and should not be taken seriously in this proceeding.

[PLMR services] as the sole source of relief, when it should look to free up spectrum allocated to the Federal Government and/or to the broadcast services, to at least partially ease the spectrum crunch for mobile



retain sufficient bandwidth to implement data transmission technologies. Comments of AAR at 20-23. Federal government spectrum that may become available for commercial use should be considered for PLMR use. Failure to seriously consider allocating additional spectrum to PLMR services, especially when the Commission is allocating frequencies to undefined radio services that may emerge, raises the specter of arbitrariness in Commission decisionmaking.

III. THE COMMISSION SHOULD PRESERVE THE RAILROAD RADIO SERVICE.

As AAR discussed in its comments, unique features of the railroad industry and its use of communications facilities justify preservation of the Railroad Radio Service and retention of AAR as frequency coordinator. The need for nationwide interoperability, the critical safety applications of PLMR systems, and the railroads' use of communications in facilitating international commerce are three aspects of the railroad industry not shared by any other PLMR service category. Comments of AAR at 6-19. Accordingly, AAR strongly opposes consolidating the Railroad Radio Service with any other PLMR users.^{1/}

The critical importance of interoperability among the different railroad companies has gained nationwide attention recently as a result of the floods plaguing the Midwest this

^{1/} If the Commission adopts its proposed Part 88, AAR urges the Commission to include a Railroad Radio Service subpart, patterned after Section 90.91 of the current rules. 47 C.F.R. § 90.91.

summer. As described in the July 26, 1993, New York Times
article "Railroads Threading Freight Around the Midwest's

While these proposals attempt to consolidate users with similar operations and/or systems, they fail to take account of the attributes that are truly unique to the railroads, particularly the nationwide interoperability requirement. Even the trucking industry, with which the railroads have some similarities, does not require interoperability among its individual member companies. Communications among truckers typically is localized. What nationwide communications do exist are within the same company, i.e., among employees of one company, and not between employees of different trucking companies. The railroads alone require a coordinated nationwide communications system operating on frequencies exclusively for the Railroad Radio Service.

AAR agrees with ATA that the existing service categories and frequency coordinators have operated effectively in the past and should remain in place.^{8/} Comments of ATA at 9-10. The Commission should not abandon the stability and continuity existing service pools and frequency coordinators provide at the same time it is making wholesale changes to nearly all rules affecting PLMR licensees. Accordingly, AAR finds merit in FCCA's proposal to delay any changes to the present radio

^{8/} AAR strongly objects to the depiction by Brown & Schwaninger ("B&S") of frequency coordinators doing little more than managing a data base. Comments of B&S at 21-28. B&S obviously does not appreciate the full range of services a frequency coordinator provides. AAR, for example, plays an indispensable role in assuring that the licensed facilities of the many individual railroad companies are interoperable throughout the nationwide rail network.

service/coordination system until after the Commission decides how to handle narrowband conversion. Comments of FCCA at 5.

IV. THE COMMISSION SHOULD MODIFY ITS PROPOSAL ON CONVERSION TO NARROWBAND.

A. Comments Reveal Widespread Concern About Cost and Impact on Operations of Conversion to Narrowband and Very Narrowband Technologies.

The comments reflect significant concern that the Commission's proposal to convert PLMR operations to narrower bandwidths would be prohibitively expensive, disruptive to operations and result in channel widths incapable of meeting users' individual requirements. Many parties questioned whether the Commission's plan actually would achieve any significant increase in channel capacity for PLMR users. The following general concerns emerged from the comments regarding the Commission's proposal for conversion to narrower bandwidths:

- PLMR users generally opposed any forced conversion to narrower bandwidths in areas where spectrum congestion is not a problem.
- PLMR users generally opposed forcing an equipment changeout earlier than would occur in the normal cycle of equipment replacement.
- Parties expressed widespread opposition to the proposed first-stage deviation reduction.
- PLMR users strongly favored a channel plan that would enable trunking, bandwidth on demand for data and other wideband applications and flexibility to implement other new technologies.
- With the exception of developers/manufacturers of very narrowband equipment, the vast majority of parties filing comments opposed mandating a very narrowband technology because such technologies are as yet unproven in the marketplace.

**B. AAR's Offset Overlay Proposal Would Achieve
the Commission's Spectrum Efficiency Goals
and Accommodate Users' Concerns.**

The offset overlay plan proposed by AAR for conversion to narrower bandwidth in the VHF band^{2/} would achieve the Commission's goal of increasing channel capacity and meet the concerns of PLMR users as expressed in the comments. Because the offset overlay plan was first fully explained in AAR's comments filed May 27, 1993, other parties obviously were not able to express support for the plan in first-round comments. AAR believes, however, that PLMR user groups and other parties will recognize the advantages of AAR's proposal and support it in their reply comments. Indeed, parties familiar with the general approach of AAR's plan expressed preliminary approval in first-round comments. See, e.g., Comments of APCO at 22 and Comments of NABER at 14 n.5. In any event, when reviewed in light of the concerns users expressed in the comments, it is clear that AAR's offset overlay plan would be far superior to the Commission's proposal (and LMCC's Option A and Option B) in meeting users' operational requirements and achieving spectrum efficiency.

**1. AAR's Plan Would Prevent Premature
and Unnecessary Equipment
Changeouts.**

The enormous cost of replacing existing PLMR equipment to convert to narrower bandwidths makes it absolutely essential that

^{2/} AAR supports the LMCC proposal for conversion to narrowband of operations in the UHF band. See Comments of AAR at 25-26.

the Commission require such conversion only in areas where it would result in relief from existing spectrum congestion. Because the Commission's proposal would require eventual conversion to narrower bandwidths by all PLMR licensees, many users have requested a blanket exemption from narrower bandwidth standards for any licensee operating in uncongested areas. See, e.g., Comments of Cascade Telephone Communications at 4-5 (southwestern Oregon and other rural areas); Comments of Montana Power Company at 6 (state of Montana); Comments of Thunder Basin Coal Company at 2 (state of Wyoming); and Comments of American Association of State Highway and Transportation Officials ("AASHTO") at 5 (states of Alaska and Hawaii Commonwealth of Puerto Rico). As UTC stated,

Since there is little, if any, spectrum congestion in rural areas it makes no sense to force private radio users in rural areas to undergo the expense and effort of a conversion to narrowband technology.

Comments of UTC at 25. UTC recommended that any system located beyond 100 miles from any of the top 100 urban areas be allowed to operate at 25 kHz on a primary basis indefinitely. Id. Other parties, rather than seeking an outright exemption, recommended that licensees in rural and uncongested areas be provided a longer time period for conversion to narrower bandwidths. See, e.g., Comments of B&S at 16-17.

AAR's plan would obviate the need for a wholesale conversion to narrowband technology by permitting users in rural areas to

serviceable. Narrowband conversion would be mandatory only in the top 40 metropolitan areas, or in areas deemed congested by the frequency coordinator. In this fashion, rural users, many of them small businesses, would be spared the expense of replacing

proposal, narrowband technology would not be required until 2004, eight years after the date new equipment would have to be capable of narrowband operation. This would provide users adequate time to amortize embedded equipment and gradually implement new technologies. Comments of AAR at 28-30.

2. AAR's Plan Would Not Require a First-Stage Deviation Reduction.

Adoption of AAR's offset overlay plan would eliminate the need for a first-stage deviation reduction as proposed by the Commission. Commenting parties thoroughly discredited the Commission's proposed deviation reduction as a burdensome and expensive modification that would significantly reduce the quality of communications and, according to some, actually decrease rather than increase spectrum efficiency. Comments of Bendix/King Radio Corporation ("Bendix") at 2.^{10/} AAR's plan would result in spectrum efficiencies far exceeding any the Commission had hoped would be gained from a deviation reduction. Comments of AAR at 30-31 (offset overlay plan could nearly double the current number of VHF channels commencing within a few years after the FCC mandated type accepted equipment has been available, providing rapid relief from spectrum congestion).

3. AAR's Plan Would Permit Trunking Earlier Than Other Proposals, Enable Bandwidth on Demand and Accommodate Other Wideband Applications.

In addition to other benefits, AAR's plan would meet users' stated preference for flexibility to utilize trunking, wideband applications and other technologies for voice and/or data according to their individual operating requirements. As AAR discussed in its comments, the offset overlay plan would yield more new channels at an earlier date than the proposals of the Commission and LMCC, creating sufficient channel pairs that would enable users to implement trunked systems. Comments of AAR at 30-31. It also would enable bandwidth on demand, which would accommodate various new wideband digital applications and users' growing need to transmit data. Comments of Ericsson Corporation at 17 (data transmission is becoming more critical part of PLMR systems); Comments of Mitchell Energy & Development Corporation at 3-4 (data transmission significant in energy operation); and Comments of Montana Power Company at 15-16 (discussing supervisory control and data acquisition and other data systems).^{11/} See Comments of AAR at 31-32 and Exhibit 9 (depicting how offset overlay plan would enable bandwidth on

^{11/} Advanced Mobilecomm, Inc. ("AMI"), a proponent of 5 kHz channels, claims that channel widths greater than that required for voice communications would be wasteful because the growth of data services is "speculative at best". Comments of AMI at 5. This assertion contradicts PLMR users' statements regarding increased data applications.

demand) .^{12/}

**4. AAR's Plan Would Give Users
Flexibility to Meet Efficiency
Standard Without Mandating Unproven
Technology.**

Despite the optimistic projections of companies seeking to market very narrowband equipment (see, e.g., Comments of Securicor PMR Systems Ltd., Nippon Telegraph and Telephone Corporation and Uniden America Corporation), the comments overwhelmingly indicate that PLMR users do not believe that 5 kHz and other very narrowband equipment has been sufficiently proven to meet their requirements. See, e.g., Comments of API at 21 and Comments of Bendix at 3. See also Comments of Motorola at 5, Ericsson at 12 and EF Johnson Company at 5 (it is premature to mandate use of very narrowband technology). AAR reached the conclusion, based on its discussions and on-site visits with several 5 kHz equipment manufacturers, that manufacturers of 5 kHz equipment will not be able to incorporate the feature sets necessary to meet railroad operating requirements for some time to come. Moreover, because of the railroads' requirement that all systems be interoperable in rural and urban areas, AAR is

^{12/} AAR's proposal to require that all equipment type accepted after January 1, 1996, be limited to 12.5 kHz bandwidth would not preclude a "bandwidth on demand" type of operation. AAR envisions that such equipment would operate on 12.5 kHz bandwidth in its customary mode for voice dispatch and other conventional communications purposes, but would be capable of operating on wider bandwidths in "override" mode, triggered by coded signals, when there is a need, for example, for a wideband data burst or other wideband applications.

especially concerned about the capability of 5 kHz equipment to be backward compatible with wideband facilities. Equipment manufacturers indicated to AAR that a dual-mode radio capable of communicating on 5 kHz and 12.5 kHz channels does not exist. Even Motorola has indicated in informal discussions that it cannot produce a product to meet this requirement. Thus, if very narrowband operations were required in urban areas, railroads would have to maintain duplicate facilities in order to communicate nationwide. Simultaneous operation of different systems creates the risk of users missing calls or other transmissions on one or the other system.

AAR's plan is consistent with the views of the many parties that favor conversion to 12.5 kHz channels or equivalent efficiency rather than very narrowband channels. See, e.g., Comments of the Telecommunications Industry Association ("TIA") LMCC, NABER, Bell Atlantic, AASHTO, Motorola, and Bendix. Moreover, it would accommodate the concerns of parties that favor mandating compliance with a spectrum efficiency standard rather than any specific channel plan or technology. See, e.g., Comments of TIA, Power Spectrum Inc., GTE, and APCO. AAR believes that its offset overlay plan would achieve the efficiency in terms of throughput that probably will be required by the spectrum efficiency standard TIA is developing. AAR's plan would achieve almost 2-to-1 efficiency purely in the number of new channels created. When the trunking capability that AAR's offset overlay plan would provide is considered, even more

efficiency would be gained.

Trunking increases operational and spectrum efficiency by facilitating the organization of user groups and thereby reducing confusion and the potential for interference among radio users. The railroads, for example, can program the control heads of trunked systems so that a system automatically uses certain predesignated channels to route messages intended for a given railroad user group. The sender of a message would not select a particular channel but, instead, would "address" the message. This would enable the railroads to divide their mobile radio users into operational groups and give railroad users with common work interests a more organized and semi-private communications link of their own, while retaining the flexibility to communicate with any other railroad user group on the same trunking system.

Moreover, as far as very narrowband requirements, AAR's plan specifically provides that when the Commission reevaluates very narrowband technology in 1999, it consider adopting "a very narrowband channel plan for congested metropolitan areas and/or a very narrowband efficiency standard, such as X bits per kHz of throughput per square mile." Comments of AAR at 29.

**V. NEWLY CREATED CHANNELS SHOULD REMAIN WITH PLMR USERS
AND NOT BE REALLOCATED TO COMMERCIAL CARRIERS.**

The comments reflect widespread opposition to the Commission's proposal to allot 258 channel pairs in the 150-162 MHz band, which would become available as a result of very narrowband conversion, for a new Specialized Mobile Radio ("SMR") Service for regional, wide-area voice and data applications. NPRM, 7 FCC Rcd at 8113. This proposal, in essence, would result in a de facto reallocation of spectrum from existing private radio users to commercial private carriers. On its face, such reallocation directly contradicts the Commission's "refarming" goal of expanding the supply of spectrum available for PLMR use. NOI, 6 FCC Rcd at 4129. Comments of Coalition at 25. The Commission's proposal is not supported by any findings or analysis that the public interest benefits to be derived from private carrier use of new channels would exceed the benefits of PLMR use of such spectrum.^{13/} To the contrary, the record indicates that sufficient spectrum already is available for private carrier operations. See, e.g., Comments of TIA at 14 ("sufficient opportunities already exist for private carriers in the 800 MHz, 900 MHz and 220 MHz bands"); Comments of API at 19 (questioning need for additional new carrier-provided mobile service when Commission has recently created new private carrier service at 220 MHz, PCS at 2 GHz and mobile satellite service);

^{13/} Such balancing of competing uses of spectrum is part of the required analysis in spectrum allocation decisions. See Section II.

Comments of AMRA at 7 ("not aware of any substantial needs for land mobile service over the large areas contemplated"); and Joint Comments at 19-20 (no justification for experimenting with "abstract and speculative" private carrier systems that are in the nature of a convenience or luxury and may never serve identifiable and specific needs of the public when there are shortages of useful PLMR spectrum in significant portions of the country).

The fact that the proposal would result in a one-third net loss of spectrum for PLMR users is reason enough for the Commission to withdraw it from consideration in this proceeding.

~~Making the new channel proposal even more expensive, however, is~~

**VI. THE COMMISSION SHOULD WITHDRAW ITS ERP PROPOSAL OR
ADOPT LMCC'S APPROACH.**

Nearly all parties commenting on the Commission's proposed limits on effective radiated power ("ERP") and antenna height above average terrain ("HAAT") registered strong opposition to